

FIRST RECORDS OF THE FAMILY NOTONECTIDAE (INSECTA : HEMIPTERA) FROM WEST VIRGINIA¹

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ABSTRACT: Notonectidae are common and widespread insects throughout the United States and Canada, but no notonectids have been reported from West Virginia. We now report this family to be represented in the state by four species in two genera, *Buenoa margaritacea*, *Notonecta indica*, *Notonecta irrorata* and *Notonecta undulata*. Additionally, we provide a list of other Notonectidae species that may occur in West Virginia.

The family Notonectidae Latreille, 1802 is a generally common and widespread family of predaceous aquatic insects in North America. It has been reported from every Canadian province and territory and most of the United States. With our report of this family from West Virginia, only three of the 48 contiguous states (Delaware, New Hampshire and North Dakota) lack published records (Hungerford, 1934; Polhemus and Polhemus, 1988; Truxal, 1953). Since species of this family have been reported from all areas surrounding these three states, it seems the lack of records for these areas is due to a lack of published accounts of this family rather than their absence. The purposes of this paper are to document the occurrence of the family Notonectidae in West Virginia, report one *Buenoa* and three *Notonecta* species as new state records and to provide a list of species that may occur in West Virginia.

METHODS

Adult backswimmers were collected during the summer of 1998 with dip nets and preserved in 70% ethanol. Museum specimens from the University of West Virginia were also examined. Identifications were made using keys, illustrations and descriptions by Hungerford (1934). Chordas and Harp (1991), Hilsenhoff (1984), Hungerford (1934), Polhemus and Polhemus (1988), Polhemus (1997), Truxal (1953) and Yeakel and Larsen (1997) provided species distribution. Voucher specimens were deposited in the Ohio Biological Survey's Aquatic Insect Collection (Museum of Biological Diversity at The Ohio State University, Columbus, Ohio) and in the first author's personal collection.

¹ Received September 4, 1998. Accepted September 21, 1998.

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RESULTS AND DISCUSSION

Four species of Notonectidae, three belonging to the genus *Notonecta* Linnaeus, 1758 and one to the genus *Buenoa* Kirkaldy, 1908, were identified from several localities throughout West Virginia. These species, *Buenoa margaritacea* Torre-Bueno, 1908, *Notonecta indica* Linnaeus, 1771, *Notonecta irrorata* Uhler, 1879 and *Notonecta undulata* Say, 1832, are the first Notonectidae reported from West Virginia.

***Buenoa margaritacea*:** A single male specimen, collected in Monongalia county in July, 1974, was identified from the University of West Virginia collection. This species is common in the midwest and eastern United States (Polhemus and Polhemus, 1988) and probably occurs throughout West Virginia.

***Notonecta indica*:** A single female specimen, collected in Putnam county in September, 1978, was identified from the University of West Virginia collection. This is a common species in the southern half of the United States with scattered records encroaching the northeast (Steve Chordas, unpublished data; Polhemus and Polhemus, 1988). West Virginia lies at the very northern edge of its known range.

***Notonecta irrorata*:** This species is common throughout the eastern portions of the United States and Canada. It has now been reported for every state east of the Mississippi River except Georgia, New Hampshire, Vermont and Delaware (Steve Chordas, unpublished data; Polhemus and Polhemus, 1988). It most commonly occurs in woodland ponds and pools in addition to other lentic habitats that are at least in part shaded (Chordas and Harp, 1991; Hungerford, 1934).

We recently collected this species from three northern counties in West Virginia. One male and four females were found on July 18, 1998 in a small road side pool along State Route 2 in Hancock county approximately three km west of Newell. One male and three females were found on June 15, 1998 in a small, apparently fishless, partly wooded pool along the Ohio River in Ohio county approximately 1.5 km south of the Ohio/Brooke county line north of Warwood. Seven males and one female were taken on June 16, 1998 from a small, apparently fishless, partly wooded road side pond off State Route 2 in Pleasants county just southwest of the Willow Island locks and dam of the Ohio River. Six specimens, five from Monongalia county and one from Taylor county, collected during May, August and September (labels lacked year of collection), were identified from the University of West Virginia collection. This species probably occurs throughout the State and is likely to be one of the most common backswimmers in West Virginia.

***Notonecta undulata*:** This species is the most common and widespread species in the United States and Canada. Including West Virginia, it has been reported from 38 of the 48 contiguous states in the U.S. and for every province and territory in Canada except the Yukon (Polhemus and Polhemus, 1988). This

species occurs in almost any lentic habitat but is most abundant in smaller fishless lentic habitats (Chordas and Harp, 1991; Hungerford, 1934).

We recently collected this species from two northern counties. Two females were taken from Ohio county and three females were taken from Pleasants county (same dates and localities as described for *N. irrorata* above). A total of 19 specimens, collected from Berkeley, Greenbrier, Hampshire, Mercer, Monongalia and Preston counties during the months of May through September (various years), were identified from the University of West Virginia collection. This species probably occurs throughout the State and may be the most common and widespread notonectid species in West Virginia.

In addition to the four species reported in this paper, four additional *Notonecta* species and three additional *Buenoa* species may occur in West Virginia (Table 1). Investigators are encouraged to report any Hemiptera records, not just from West Virginia but throughout the United States and Canada, as a contribution to the ongoing effort to document the Hemiptera fauna of this region (Polhemus and Polhemus, 1988; Yeakel and Larsen, 1997).

Table 1. Notonectidae species known or likely to occur in West Virginia

Genus	<i>Notonecta</i>	<i>Buenoa</i>
Species	<i>N. indica</i> Linnaeus, 1771 * <i>N. insulata</i> Kirby, 1837 <i>N. irrorata</i> Uhler, 1879 * <i>N. petrunkevitchi</i> Hutchinson, 1945 <i>N. raleighi lunata</i> Hungerford, 1926 <i>N. uhleri</i> Kirkaldy, 1897 <i>N. undulata</i> Say, 1832 *	<i>B. confusa</i> Truxal, 1953 <i>B. limnocastoris</i> Hungerford, 1923 <i>B. margaritacea</i> Torre-Bueno, 1908 * <i>B. scimitra</i> Bare, 1925

* = Species newly reported for West Virginia in this paper.

ACKNOWLEDGMENTS

We thank the Ohio Biological Survey for providing travel funds and the University of West Virginia for providing museum specimens. We thank Keith Philips and Foster F. Purrington (The Ohio State University) for reviewing early drafts of this manuscript. We also thank two additional reviewers for their critical review and pertinent suggestions which improved the manuscript.

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BOOKS RECEIVED AND BRIEFLY NOTED

ENHANCING BIOLOGICAL CONTROL, 1998. C.H. Pickett and R.L. Bugg, eds. Univ. California Press. 433 pgs; 6 b/w illus., 75 figs., 48 tables. \$50.00 hdbk.

The subtitle of this book, "Habitat Management to Promote Natural Enemies of Agricultural Pests" pretty well covers the thrust of this book. The authors claim this is the first comprehensive summary of recent findings on habitat manipulation to control pests.

PARASITES IN SOCIAL INSECTS. 1998. P. Schmid-Hempel. Princeton University Press. 409 pp. \$85.00 cloth, \$35.00 paper.

This book provides an overview of existing knowledge of parasites of social insects and analyzes how parasites shape the biology of social insects: ants, wasps, bees, and termites. Appendix 2 provides a comprehensive listing of the parasites of social insects, including references, and thus is a superb guide to current research and relevant literature.

CONSERVATION AND BIODIVERSITY. 1998. A.P. Dobson. Scientific American Library. 264 pp. 8" x 9" format. \$19.95 paper.

As species disappear at an unprecedented rate, scientists work to conserve the Earth's biodiversity. In this book, the author explores the management of endangered species, the economics of different conservation techniques, and the practical possibilities for using the environment while sustaining it. Case studies describe the changes in animal populations before and after management attempts.

THE INSECTS: STRUCTURE AND FUNCTION, 4th ed. 1998. R.F. Chapman. Cambridge University Press. 770 pp. \$130.00 hard, \$54.95 paper.

A completely rewritten update of a well established standard text and reference work for students and researchers in zoology, entomology, and physiology.

THYSANOPTERA, AN IDENTIFICATION GUIDE, 2nd ed. 1998. L.A. Mound and G. Kibby. CAB International/Oxford University Press. 70 pp. 8-1/2 x 12 format. Spiral bound. Cloth \$35.00.

Because of difficulties in using the first edition of this identification guide, this second edition has been entirely redrafted into a visual key to genera so as to make it easier to recognize the character states necessary to identification.